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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MCCLELLAND, KIMBERLY KEIL

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

04/30/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/509,754	Applicant(s) KISHIMOTO ET AL.	
	Examiner KIMBERLY K. MCCLELLAND	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4 and 7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4 and 7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant is reminded they need to explicitly point out where support for all the newly claimed features comes from as required by MPEP 714.02 and 2163.06. See 37 CFR 1.111.

Drawings

2. Figures 5-7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,936,575 to Watanabe et al. in view of U.S. Patent No. 7,017,265 to Tani et al. and Japanese Patent Application Publication No. 07-288384 to Tamura et al.

5. With respect to claim 1, Watanabe et al. discloses a method of making metal-clad laminates, including laminating a metal foil on one face of a prepreg sheet; placing a mold-releasing sheet on another face of the prepreg sheet; heating and pressing a given place of the prepreg sheet and the metal foil via the mold-releasing sheet by a heat and press means, after the placing step; peeling off the mold-releasing sheet, after heating and pressing the given place; heating an entire face of the prepreg sheet and the metal foil after the peeling off step (10, line 54-column 11, line 44). However, Watanabe et al. does not specifically disclose the partial heating and pressing followed by heating and pressing the entire face of the prepreg and metal foil or the temperature allows the resin to be kept in stage-B status.

6. Tani et al. discloses a method for manufacturing a multilayer wiring board, including during lamination, the temperature allows the resin to be kept in stage-B status (i.e. incomplete curing; column 14, lines 16-28), prior to a final curing step (column 14, lines 28-32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the b-stage laminating step taught by Tani et al. with the lamination method disclosed by Watanabe et al. The motivation would have been to adapt to the specific material requirements of the prepreg and allow the prepreg layer to be cured in a separate step (column 9, lines 25-35).

7. Tamura et al. discloses a manufacturing method for wiring boards, including it is known in the art to apply partial heat and pressure during lamination and subsequently heating and pressing the entire face of the laminate (see Abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the partial heat and pressing step taught by Tamura for the heating and pressing of the entire surface disclosed by Watanabe et al. and the heating and pressing the entire face of the laminate taught by Tamaru et al. for the drying step disclosed by Watanabe (column 11, lines 35-44). The motivation would have been to achieve the desired bonding strength between the metal foil and prepreg. Simple substitution of one known element (partial heat and pressing followed by complete heating and pressing of Tamaru) for another (Watanabe's roller heat and press device) would achieve the predictable result of localized bonding of the laminate.

8. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,936,575 to Watanabe et al. in view of U.S. Patent No. 5,482,286 to Fujikake et al., U.S. Patent No. 7,017,265 to Tani et al., and Japanese Patent Application Publication No. 07-288384 to Tamura et al.

9. With respect to claim 2, Watanabe et al. discloses a method of making metal-clad laminates, including laminating a metal foil on one face of a prepreg sheet; placing a mold-releasing sheet on another face of the prepreg sheet; heating and pressing a given place of the prepreg sheet and the metal foil via the mold-releasing sheet by a heat and press means, after the placing step; peeling off the mold-releasing sheet, after

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heating and pressing the given place (10, line 54-column 11, line 44). Watanabe et al. also discloses the laminate is used to form printed circuit boards (See Abstract).

However, Watanabe et al. does not specifically disclose laminating the other substrates to the copper clad laminate, the partial heating and pressing followed by heating and pressing the entire face of the prepreg after the mold release sheet is removed or temperature allows the resin to be kept in stage-B status.

10. Fujikake et al. discloses a method of making printed wiring boards, including subsequently joining the board substrate, second prepreg, and second metal foil onto the copper clad laminate (column 2, lines 58-67). These steps include: laminating a board having a circuit pattern on the another face of the first prepreg sheet, after the peeling off step; laminating a second prepreg sheet on the board, after heating and pressing the second given place; laminating a second metal foil on the second prepreg sheet, after heating and pressing the third given place. It would have been obvious to one of ordinary skill in the art to combine the multilayer circuit board manufacturing steps taught by Fujikake et al. with the clad laminate making steps disclosed by Watanabe et al. The motivation would have been to effectively form a multilayer circuit board.

11. Tani et al. discloses a method for manufacturing a multilayer wiring board, including during lamination, the temperature allows the resin to be kept in stage-B status (i.e. incomplete curing; column 14, lines 16-28), prior to a final curing step (column 14, lines 28-32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the b-stage laminating step taught by Tani

et al. with the lamination method disclosed by Watanabe et al. The motivation would have been to adapt to the specific material requirements of the prepreg and allow the prepreg layer to be cured in a separate step (column 9, lines 25-35).

12. Tamura et al. discloses a manufacturing method for wiring boards, including it is known in the art to apply partial heat and pressure during lamination and subsequently heating and pressing the entire face of the laminate (see Abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the partial heat and pressing step taught by Tamura for the heating and pressing of the entire surface disclosed by Watanabe et al. and the heating and pressing the entire face of the laminate taught by Tamaru et al. for the drying step disclosed by Watanabe (column 11, lines 35-44). The motivation would have been to achieve the desired bonding strength between the metal foil and prepreg. Simple substitution of one known element (partial heat and pressing followed by complete heating and pressing of Tamaru) for another (Watanabe's roller heat and press device) would achieve the predictable result of localized bonding of the laminate.

13. In general, the transposition of process steps or the splitting of one step into two, where the processes are substantially identical or equivalent in terms of function, manner and result, was held to be not patentably distinguish the processes. *Ex parte Rubin*, 128 USPQ 440 (Bd. Pat. App. 1959). The separation of the partial heating and pressing steps from one step into four separate steps after each substrate is attached is not patentably distinct from a single partial heating and pressing step, unless new and unexpected results occur. It would have been obvious to one of ordinary skill in the art

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at the time the invention was made to perform individual partial heating and pressing steps as taught by Tamaru after each lamination substrate of Fujikake, when combined with the metal clad laminate and releasing sheet of Watanabe, prior to a final total curing step using heat and pressure as disclosed by Tani for the reasons suggested above.

14. As to claim 4, Watanabe discloses a process of forming multilayer circuit boards, including the board having a circuit pattern is a composite of thermosetting resin and one of woven fiber or non-woven fiber (column 12, lines 22-28).

15. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,936,575 to Watanabe et al. in view of U.S. Patent No. 7,017,265 to Tani et al. and Japanese Patent Application Publication No. 07-288384 to Tamura et al. as applied to claim 1 above, and further in view of 4,994,133 to Oizumi et al.

16. With respect to claim 7, Watanabe et al. does not specifically disclose the peeling off of the mold-releasing sheet peels off the sheet from one side of the sheet gradually and sequentially toward another side.

17. Oizumi et al. discloses a process for producing reinforced resin laminates, including the peeling off of the mold-releasing sheet (10) peels off the sheet from one end of the sheet toward another end (22/24; See Figure 4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the gradual peeling step taught by Oizumi et al. in the laminating step taught by Watanabe

et al. The motivation would have been to allow the release sheet to be reliably peeled and stored in roll form (22; See Figure 4).

18. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,936,575 to Watanabe et al. in view of U.S. Patent No. 5,482,286 to Fujikake et al., U.S. Patent No. 7,017,265 to Tani et al., and Japanese Patent Application Publication No. 07-288384 to Tamura et al. as applied to claims 2 and 4 above, and further in view of 4,994,133 to Oizumi et al.

19. With respect to claim 7, Watanabe does not specifically disclose the peeling off the mold-releasing sheet peels off the sheet from one side of the sheet gradually and sequentially toward another side.

20. Oizumi et al. discloses a process for producing reinforced resin laminates, including the peeling off of the mold-releasing sheet (10) peels off the sheet from one end of the sheet toward another end (22/24; See Figure 4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the gradual peeling step taught by Oizumi et al. in the laminating step taught by Watanabe. The motivation would have been to allow the release sheet to be reliably peeled and stored in roll form (22; See Figure 4).

21. Claims 1-2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of U.S. Patent No. 7,017,265 to Tani et al.

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22. As to claim 1, applicant's admitted prior art discloses a conventional method of manufacturing double sided boards, including laminating a metal foil on one face of a prepreg sheet; placing a mold-releasing sheet on another face of the prepreg sheet; heating and pressing a given place of the prepreg sheet and the metal foil via [[the mold-releasing sheet by a partial heat and press means, after the placing step; peeling off the mold-releasing sheet, after heating and pressing the given place, and heating and pressing an entire face of the prepreg sheet and the metal foil, after the peeling off step (See paragraphs 0004-0020 and Figures 5-7). However, Applicant's admitted prior art does not specifically disclose the heating and pressing temperature allows the resin to be kept in stage-B status.

23. Tani et al. discloses a method for manufacturing a multilayer wiring board, including during lamination, the temperature allows the resin to be kept in stage-B status (i.e. incomplete curing; column 14, lines 16-28), prior to a final curing step (column 14, lines 28-32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the b-stage laminating step taught by Tani et al. with the lamination method disclosed by applicant's admitted prior art. The motivation would have been to adapt to the specific material requirements of the prepreg and allow the prepreg layer to be cured in a separate step (column 9, lines 25-35).

24. As to claim 2, applicant's admitted prior art discloses a conventional method of manufacturing double sided boards, including laminating a metal foil on one face of a prepreg sheet; placing a mold-releasing sheet on another face of the prepreg sheet;

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heating and pressing a given place of the prepreg sheet and the metal foil via [[the mold-releasing sheet by a partial heat and press means, after the placing step; peeling off the mold-releasing sheet, after heating and pressing the given place, and heating and pressing an entire face of the prepreg sheet and the metal foil, after the peeling off step; laminating a board having a circuit pattern on the another face of the first prepreg sheet, after the peeling off step; heating and pressing a second given place for bonding the first prepreg sheet and the board, after laminating the board; laminating a second prepreg sheet on the board, after heating and pressing the second given place; heating and pressing a third given place for bonding the second prepreg sheet and the board, after laminating the second prepreg; laminating a second metal foil on the second prepreg sheet, after heating and pressing the third given place; heating and pressing the at a fourth given place of the second metal foil and the second prepreg sheet; and heating and pressing an entire face of the first prepreg sheet, the first metal foil, the board, the second prepreg sheet, and the second metal foil after heating and pressing the fourth given place (See paragraphs 0004-0020 and Figures 5-7). However, Applicant's admitted prior art does not specifically disclose the heating and pressing temperature allows the resin to be kept in stage-B status.

25. Tani et al. discloses a method for manufacturing a multilayer wiring board, including during lamination, the temperature allows the resin to be kept in stage-B status (i.e. incomplete curing; column 14, lines 16-28), prior to a final curing step (column 14, lines 28-32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the b-stage laminating step taught by Tani

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et al. with the lamination method disclosed by applicant's admitted prior art. The motivation would have been to adapt to the specific material requirements of the prepreg and allow the prepreg layer to be cured in a separate step (column 9, lines 25-35).

26. As to claim 4, applicant's admitted prior art discloses a process of forming multilayer circuit boards, including the board having a circuit pattern is a composite of thermosetting resin and one of woven fiber or non-woven fiber (See paragraphs 0004-0020 and Figures 5-7).

27. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of U.S. Patent No. 7,017,265 to Tani et al. as applied to claims 1-2 and 4 above, and further in view of 4,994,133 to Oizumi et al.

28. With respect to claim 7, applicant's admitted prior art does not specifically disclose the peeling off the mold-releasing sheet peels off the sheet from one side of the sheet gradually and sequentially toward another side.

29. Oizumi et al. discloses a process for producing reinforced resin laminates, including the peeling off of the mold-releasing sheet (10) peels off the sheet from one end of the sheet toward another end (22/24; See Figure 4). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the gradual peeling step taught by Oizumi et al. in the laminating step taught by applicant's admitted prior art. The motivation would have been to allow the release sheet to be reliably peeled and stored in roll form (22; See Figure 4).

Response to Arguments

30. Applicant is reminded they need to explicitly point out where support for all the newly claimed features comes from as required by MPEP 714.02 and 2163.06. See 37 CFR 1.111.

31. Applicant's arguments with respect to claims 1-2, 4, and 7 have been considered but are moot in view of the new ground(s) of rejection. Applicant's arguments are primarily based on the newly added limitations to independent claims 1 and 2.

Applicant's remaining pertinent arguments are addressed below:

32. As to applicant's argument that Tani is does not disclose laminating a copper foil to a prepreg, examiner disagrees. Column 14, lines 16-28 of Tani clearly disclose a laminating method where an uncured b-stage epoxy resin sheet is laminated under heat and pressure to the copper-faced core substrate. The copper foil on the core substrate in Tani et al. is absent any coupling agent. Consequently, the required step of laminating a metal foil to a b-stage prepreg, while the prepreg is maintained in b-stage is taught in the disclosure of Tani et al. As to applicant's arguments that there is no motivation to combine Tani with the prior art, examiner notes the stated intent in column 9, lines 32-35 to perform a second, separate curing process depending on the properties of the resin used is desirable for any lamination step. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the b-stage laminating step taught by Tani et al. with the lamination method disclosed by the prior art. The motivation would have been to adapt to the specific material

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requirements of the prepreg and allow the prepreg layer to be cured in a separate step (column 9, lines 25-35).

33. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

34. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KIMBERLY K. MCCLELLAND whose telephone number is (571)272-2372. The examiner can normally be reached on 8:00 a.m.-5 p.m. Mon-Thr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip C. Tucker can be reached on (571)272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. K. M./
Examiner, Art Unit 1791

KKM

/Philip C Tucker/
Supervisory Patent Examiner, Art Unit 1791